

ABSTRACT

In a thermoacoustic apparatus including a loop tube, a standing wave and a traveling wave are generated rapidly and, thereby, heat exchange is performed rapidly and efficiently. The thermoacoustic apparatus includes a first stack 3a sandwiched between a first high-temperature-side heat exchanger 4 and a first low-temperature-side heat exchanger 5 and a second stack 3b sandwiched between a second high-temperature-side heat exchanger 6 and a second low-temperature-side heat exchanger 7 in the inside of a loop tube 2. An acoustic wave is generated through self excitation by heating the first high-temperature-side heat exchanger 4, and the second low-temperature-side heat exchanger 7 is cooled by a standing wave and a traveling wave. The loop tube is configured to include a plurality of linear tube portions 2a along the vertical direction and connection tube portions 2b shorter than the linear tube portions 2a, and the first stack 3a is disposed in the longest linear tube portion 2a.